

REMARKS

The present application was filed on July 7, 2003 with claims 1 through 23. Claim 24 was added in the Amendment and Response to Office Action dated December 16, 2008. Claims 1 through 24 are presently pending in the above-identified patent application. Claims 1, 21, and 22 are amended herein.

In the Office Action, the Examiner rejected claims 7-9 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-4, 6, 21, 22 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Devi (United States Patent Publication No. 2003/0147400; hereinafter Devi), in view of Aukia et al. (United States Patent Number 6,594,268; hereinafter Aukia), and further in view of Soumiya et al. (United States Patent Publication No. 2001/0037401 A1; hereinafter Soumiya). Claims 5, 7-9, 13 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Devi in view of Aukia in view of Soumiya, and further in view of Szviovski et al. (United States Patent Number 6,956,821; hereinafter Szviovski), and claim 23 is rejected under 35 U.S.C. §103(a) as being unpatentable over Szviovski and in view of Shabtay et al. (United States Patent Number 6,895,441; hereinafter Shabtay), and further in view of Hameleers et al. (United States Patent Publication No. 2001/0026549; hereinafter Hameleers). The Examiner indicated that claims 10-12, 14, 15, and 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Section 112 Rejections

Claims 7-9 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 7, the Examiner asserts that the claim is vague and indefinite because it is not understood how a first pruned network is created twice: after pruning edges that do not have a first available bandwidth from the network and pruning edges that do not have a second available bandwidth from the network.

Contrary to the Examiner's assertion, the first pruned network is created once. Only one of the last two steps of claim 7 is performed, since the conditional statements ("when

the designed load between the source node and the destination node is greater than a measured load between the source node and the destination node” and “when the designed load between the source node and the destination node is not greater than a measured load between the source node and the destination node”) are mutually exclusive, only one of the last two steps is performed and therefore only one first pruned network is created.

Thus, Applicants respectfully request that the section 112 rejection be withdrawn.
Independent Claims 1, 21 and 22

Independent claims 1, 21, and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Devi, in view of Aukia et al, and further in view of Soumiya. Regarding claim 1, the Examiner asserts that Devi discloses determining, in response to a request, whether any path of a plurality of predetermined paths between a source node and a destination node meets at least one requirement corresponding to the request, wherein the plurality of predetermined paths are determined by substantially maximizing a carried demand on a network using at least traffic demand estimates, network topology information, and by performing routing for the substantially maximized carried demand (FIGS. 1 and 2; paragraphs [0004]-[0005], [0014], [0026], and [0028]-[0029]). The Examiner acknowledges that Devi as modified by Aukia fails to explicitly disclose selecting one of said predetermined paths based on current load measurement at a source node, but asserts that Soumiya discloses the cited limitation (FIGS. 1A and 1B; abstract; paragraph [0232]).

Applicants note that independent claims 1, 21, and 22 have been amended to require determining, in response to a connection request, whether any path of a *plurality of predetermined paths between a source node and a destination node* meets at least one requirement corresponding to the request, wherein the plurality of predetermined paths are determined by substantially maximizing a carried demand on a network using at least traffic demand estimates and network topology information, and by performing routing for the substantially maximized carried demand; and *selecting one of said predetermined paths for said requested connection based on a current load measurement*, wherein said current load measurement is measured at a source node, if a given path meeting the at least one requirement is found. Support for this amendment can be found on page 5, line 28, to page 6, line 12 of the originally filed disclosure.

As the Examiner acknowledges, Devi as modified by Aukia does *not* disclose or suggest *selecting one of said predetermined paths for a connection between a source node and a destination node based on a current load measurement*, wherein said current load measurement is *measured at a source node*. Furthermore, Applicants note that Soumiya is directed to “distributing the load between the set routes among a plurality of routes.” (See, abstract and FIG. 1A.) Soumiya does *not* address the subject of selecting a path for a requested connection (known in the art as “call admission”) and does *not* disclose or suggest *selecting one of said predetermined paths for a requested connection between a source node and a destination node based on a current load measurement*. Neither Devi nor Aukia nor Soumiya, alone or in combination, disclose or suggest *selecting a predetermined path for a requested connection (between a source node and a destination node) based on a current load measurement measured at a source node*, as required by independent claims 1, 21, and 22, as amended.

Applicants also note that, as the Examiner previously acknowledged, Aukia discloses a technique similar to OSPF and teaches that each node in the network determines, in a distributed manner, *the path for the source-destination pair that traverses the node*. In fact, OSPF is well known to require that each node in the network determines, in a *distributed* manner, *the path for the source-destination pair that traverses the node*.

Thus, even as combined in the manner suggested by the Examiner, Devi and Aukia *do not teach every element of the independent claims*. Furthermore, based on the KSR considerations discussed hereinafter, the combination/modification suggested by the Examiner is not appropriate.

KSR Considerations

An Examiner must establish “an apparent reason to combine ... known elements.” *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. ___, 82 USPQ2d 1385 (2007). Here, the Examiner merely states that it would have been obvious to incorporate defining the network topology, traffic characteristics and demand for service as taught by Aukia to the optimization method based on demand estimate as disclosed by Devi for the purpose of maximizing revenue based on current and past history of data traffic of a router.

Applicants, however, are claiming a new technique for traffic engineering in a network-based communication system wherein a *predetermined path for a requested connection*

(between a source node and a destination node) is selected from a plurality of predetermined paths based on a current load measurement measured at a source node. There is no suggestion in Devi, Aukia, and Soumiya, alone or in combination, to select a predetermined path for a requested connection (between a source node and a destination node) from a plurality of predetermined paths based on a current load measurement measured at a source node.

Furthermore, Aukia's teaching to have *each node along a path compute its own route to a next node teaches away* from the present invention's. The KSR Court discussed in some detail United States v. Adams, 383 U.S. 39 (1966), stating in part that in that case, "[t]he Court relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." (KSR Opinion at p. 12). Thus, there is no reason to make the asserted combination/modification.

Thus, Devi, Aukia, and Soumiya, alone or in combination, do not disclose or suggest determining, in response to a connection request, whether any path of a plurality of predetermined paths between a source node and a destination node meets at least one requirement corresponding to the request, wherein the plurality of predetermined paths are determined by substantially maximizing a carried demand on a network using at least traffic demand estimates and network topology information, and by performing routing for the substantially maximized carried demand; and selecting one of said predetermined paths for said requested connection based on a current load measurement, wherein said current load measurement is measured at a source node, if a given path meeting the at least one requirement is found, as required by independent claims 1, 21, and 22, as amended.

Independent Claim 23

Independent claim 23 was rejected under 35 U.S.C. §103(a) as being unpatentable over Szviatovszki in view of Shabtay, and further in view of Hameleers et al. Regarding claim 23, the Examiner asserts that Szviatovszki discloses that, if a length of the second shortest path is equivalent to a length of the first shortest path, attempting to create a connection on the second shortest path (col. 12, lines 37-43). The Examiner acknowledges that Szviatovszki does not disclose, but asserts that Shabtay discloses that, if a length of the second shortest path is not equivalent to a length of the first shortest path, performing the following steps (col. 5, lines 18-

19; col. 4, lines 14-21; col. 5, lines 12-22; and col. 4, lines 35-42 and 61-67); pruning edges not having a second available bandwidth from the first pruned network, thereby creating a second pruned network (col. 5, lines 19-22); computing a third shortest path between the source node and destination node using the second pruned network (col. 5, lines 19-22); and attempting to
5 create a connection on the third shortest path (col. 5, lines 19-22). The Examiner previously asserted that “the length information is provided by OSPF protocol, or that it is combined by bandwidth availability information of the links to utilize rerouting mechanism.” In the Response to Arguments section of the previous final Office Action, the Examiner asserted that the length information is considered as the length of a path as being smaller or smallest. The Examiner
10 asserted that Applicant should clarify what the length information represents in the claim and should explain the differences between the Shortest Path and the length information. In the present Office Action, the Examiner asserts that Hameleers discloses that one of the metrics of OSPF is the distance metric such as physical distance.

As noted above, the Examiner asserts that Szviatovszki discloses, if a length of
15 the second shortest path is equivalent to a length of the first shortest path, attempting to create a connection on the second shortest path (col. 12, lines 37-43).

Applicants note that, in the text cited by the Examiner, Szviatovszki teaches:

A similar procedure may be applied to determine the path with the
20 fewest affected, lower priority levels. Using the bandwidth pre-emption vector B_p measure as a link metric, the affected priority levels may be minimized by pre-empting only those LSPs with the lowest priority. A comparator function is defined for the bandwidth pre-emption vector measure as follows:

$B_p^1 < B_p^2$ if for their first (counting from 0) different coordinate
25 with index

$$i, B_{pl}^1 < B_{pl}^2$$

With this definition, the comparator function implements two tie-breaking
30 concepts. If two paths have different, highest-affected priority levels, the path with the lower priority level is chosen. But if the affected priority levels are the same, the “smaller” path is selected with the lowest pre-empted bandwidth on the highest affected priority level.
(Col. 12, lines 37-43.)

Applicants note that Szviatovszki teaches “preemption” in the cited text. Contrary
35 to the Examiner’s assertion, Szviatovszki does *not* disclose or suggest *attempting to create a*

connection and does not disclose or suggest attempting to create a connection on the second shortest path if a length of the second shortest path is equivalent to a length of the first shortest path.

Applicants also note that the word “length” is defined as “the longest extent of anything as measured from end to end.” (See, dictionary.com.) In the text cited by the Examiner, Szviatovszki teaches that, “if two paths have different, highest-affected priority levels, the path with the lower priority level is chosen. But if the affected priority levels are the same, the ‘smaller’ path is selected with the lowest pre-empted bandwidth on the highest affected priority level.” (Col. 12, lines 37-43; emphasis added.) Contrary to the Examiner’s assertion, Szviatovszki does not disclose or suggest length information; Szviatovszki discloses priority levels and pre-empted bandwidth.

In addition, contrary to the Examiner’s assertion, Shabtay utilizes an available bandwidth parameter (see, for example, col. 5, lines 18-19). Applicants could find no disclosure or suggestion of length information in Shabtay.

Applicants also could find no disclosure or suggestion that the length information is provided by the OSPF protocol, or that it is combined by bandwidth availability information of the links to utilize a rerouting mechanism.

Regarding the Examiner’s assertion that one of the metrics of OSPF is the distance metric such as physical distance, Applicants note that Hameller’s teaching that OSPF supports distance metrics does not infer that a length of a second shortest path is computed and does not infer that a length of a second shortest path is used to determine if an attempt is made to create a connection on the second shortest path, or is used to determine if the following steps are performed:

pruning edges not having a second available bandwidth from the first pruned network, thereby creating a second pruned network;

computing a third shortest path between the source node and destination node using the second pruned network; and

attempting to create a connection on the third shortest path.

Thus, Szviatovszki, Shabtay, and Hamelers, alone or in combination, do not disclose or suggest a length of a second shortest path, and do not disclose or suggest computing a

second shortest path between the source node and the destination node using the first pruned network; if a length of the second shortest path is equivalent to a length of the first shortest path, attempting to create a connection on the second shortest path; and if a length of the second shortest path is not equivalent to a length of the first shortest path, performing the following steps:

pruning edges not having a second available bandwidth from the first pruned network, thereby creating a second pruned network;

computing a third shortest path between the source node and destination node using the second pruned network; and

attempting to create a connection on the third shortest path, as required by independent claim 23.

Dependent Claims 2-22 and 24

Claims 2-22 and 24 are dependent on independent claim 1 and are therefore patentably distinguished over Devi, Aukia, Shabtay, Szviatovszki, Soumiya, and Hameleers, alone or in combination, because of their dependency from amended independent claim 1 for the reasons set forth above, as well as other elements these claims add in combination to their base claim. The Examiner has already indicated that claims 10-12, 14, 15, and 17-20 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Conclusion

All of the pending claims following entry of the amendments, i.e., claims 1-24, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The attention of the Examiner to this matter is appreciated.

Respectfully,



Date: February 22, 2010

Kevin M. Mason
Attorney for Applicant(s)
Reg. No. 36,597
Ryan, Mason & Lewis, LLP
1300 Post Road, Suite 205
Fairfield, CT 06824
(203) 255-6560